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RESEARCH

The Reflective Practice Framework for Phenomenographic Data Analysis

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Abstract
In phenomenographic studies, the use of reflection is not commonly reported. Drawing on the different schools of thought and reported frameworks, this paper introduces the Reflective Practice Framework for phenomenographic data analysis. The article describes theoretical stances and constituent elements of the framework, which consist of the two levels and five steps of reflection. The application of the framework allows for a systemic account of situational factors and personal influences during the process of phenomenographic data analysis. The framework provides a clear-cut guideline for novice phenomenographers on how to maintain reflection when working on the analysis of unstructured phenomenographic data and considering assumptions, biases, and alternative perspectives.

Keywords Reflexivity · Reflective practice · Positionality · Phenomenographic research

Introduction

Over the last two decades, researchers have shown considerable interest in reflective qualitative inquiry and practice (Crathern 2001; Cokely & Deplacido 2012; Call-Cummings and Ross 2019; Donohoe 2019; Foley 2002; Simpson and Courtney 2007). Reflective practice as a methodological tool emerged in feminist research and initially involved asking questions about power imbalances (Day 2012). The concept has expanded to include reflection on personal biases, subjectivity, and theoretical commitments. Articulating a researcher's position through writing is another instance of the use of reflection within qualitative studies, allowing the author's voice to be visible to the reader (Harding, 1989; Day 2012). Thus, over time, reflection has become associated with the researcher's subjectivity, positionality and their influences on the research (Brown, 2019).

While reflection (a process of careful, considered, deep thinking) and reflexivity (a process of questioning one's own thinking) are well-recognised concepts in many qualitative

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methodologies, their practical application remains relatively understudied (Donohoe 2019; Oxford English Dictionary). Call-Cummings and Ross (2019) argued that reflection and reflexivity are "issued as a call - an important step to take to establish the validity, rigour, or ethical nature of the research" (p. 4). However, there is little consensus on how reflection as a practice should be conducted. As Pillow (2003) put it, she remains "puzzled by how to teach students to be reflexive" (p. 171).

Reflection is an important tool in many qualitative methodologies, such as phenomenology, ethnography, narrative or feminist research. In phenomenography, however, the explicit use of reflection is less common, despite the highly iterative and interpretative nature of this approach to research. A peculiar feature of phenomenographic data analysis is that it deals with rich and unstructured data. Phenomenographers emphasise that there is no single algorithm to analyse such data, although general suggestions have been provided on how to uncover the meanings participants attribute to the phenomenon under investigation (Marton, 1986; Dahlgren and Fallsberg 1991). Participants' perspectives must be carefully analysed, ensuring the preservation of the second-order perspective represented by individuals' subjective experiences of reality (Marton 1981).

The argument of this paper centres around the premise that a holistic approach to reflection, considering situational factors and a researcher's personal influences and biases, is paramount for ensuring quality research outcomes in phenomenographic inquiry. Yet, despite the potential of reflection to enhance phenomenographic data analysis, its value is somewhat neglected. To address this gap, the Reflective Practice Framework (RPF) was developed to provide a systemic approach that integrates personal and situational factors with a step-by-step guidance for reflection on phenomenographic data analysis. This systemic approach fosters and guides critical thinking, enabling phenomenographic researchers to navigate the complexities of data analysis.

The article is structured as follows: firstly, it provides a literature review of various perspectives on reflection within phenomenological research, and outlines frameworks and models for reflection used in other methodologies. Secondly, it introduces a theoretical framework, discussing different schools of thought on reflection and reflexivity. Thirdly, it describes the methodology used to develop the RPF. Following this are the Results and Discussion sections. Finally, the conclusion and limitations of the study are presented.

Literature Review

Reflection in Phenomenological Studies

Reflection is an important tool in phenomenological studies. Husserl's descriptive phenomenology (1965) emphasised the practice of reduction or bracketing, wherein researchers set aside personal assumptions and preconceptions regarding a phenomenon. Sanders (1982) also advocated a descriptive phenomenological approach, describing phenomenology as a technique which aims to "make explicit the implicit structure and meaning of human experiences" by elucidating the universal pure essences underlying human consciousness (p. 354). This is achieved through four levels of analysis: describing the phenomenon based on research participants' experiences, identifying common themes, exploring individual perceptions of the phenomenon while retaining these themes, and finally, interpreting and

abstracting the essences of individuals' perceptions (Sanders 1982). A limitation of Sanders' methodology is the lack of guidance on how to rigorously bracket assumptions and biases, especially during the process of abstracting the research participants' interpretations. Heidegger (1988) challenged the idea of bracketing and emphasised the role of interpretation, influencing the development of "hermeneutic" or "interpretive" phenomenological inquiry.

In the field of education, Van Manen (1990) contributed to the further development of hermeneutic phenomenology, which combined the elements of the descriptive and interpretive approaches. Specifically, hermeneutic phenomenology adopts a descriptive (phenomenological) approach aiming to observe how things manifest themselves. Additionally, it employs an interpretive (hermeneutic) method, asserting that all phenomena are inherently interpreted experiences (Van Manen 1990). Like Heidegger, Van Manen (1990) advocated against bracketing and stressed the importance of documenting the process of thinking through multiple writing sessions to practise consideration and thoughtfulness.

Further, Smith and his colleagues played a role in advancing interpretative phenomenological analysis (IPA) (Smith & Osborne, 2008; Smith et al. 2009). Smith and Osborne (2008) offered a framework to assist researchers in their interpretation of their study participants' accounts of a particular experience or phenomenon - the approach referred to as double hermeneutic. IPA framework offers flexible guidelines to make lucid the interpretation of individuals' accounts of their social and individual environments and the importance they attach to specific experiences or events (Smith and Osborn 2003).

To summarise, phenomenological research provides insights into the need for intentional and thoughtful reflection, recognising the inherent interconnectedness between individuals and how they experience the world. However, conventional reflective methods, such as bracketing, have faced criticism (Heidegger, 1988; Van Manen 1990). Furthermore, representatives of both descriptive and IPA approaches lack sufficient methodological guidance compatible with phenomenographic methodology. These limitations highlight the need for exploring more suitable tools and models for reflection that can be adopted to phenomenographic data analysis.

Frameworks for Reflection

In this section, I discuss practical tools and models for reflection within various research methodologies that have been reported in the literature (see Table 1).

A model developed by Van Manen (1977), based on the work of Habermas, has a hierarchical structure with three levels of reflection. At the first level of technical reflection, the effectiveness and efficiency of achieving set goals are considered, e.g., reflection upon the competencies and means required to realise research goals. At the second level, means identified for achieving research goals, their adequacy and rationale are examined against these goals and anticipated outcomes. Finally, at the third level, critical reflection, ethical and moral considerations to address individual biases are incorporated. A model of reflection by Valli (1997) contains elements of Schon's (1983) and Van Manen's (1977) frameworks. Valli proposed five levels of reflection. First, technical reflection requires an individual to match competencies with professional standards and external goals, and continuously improve professional performance concerning these predetermined benchmarks. At the second level, an individual must engage in ongoing reflection during and after an activity to ensure continuous internal discussion and reconsideration of emerging issues. The

Table 1 Models of reflection

Author	Year	Description of the model
Van Manen	1977	Hierarchical model with three levels: (1) technical reflection (e.g., reflection upon the competencies and means required to realise research goals), (2) practical reflection (e.g., identification and evaluation of means for achieving research goals), and (3) critical reflection (ethical and moral considerations).
Gore & Zeichner	1991	A model with four varieties of reflective practice: (1) academic reflection, (2) social efficacy reflection, (3) developmental reflection, and (4) social reconstructionist reflection.
Valli	1992	A model with five levels: (1) technical reflection (Van Manen 1977), (2) reflection-in-action and reflection-on-action (Schon, 1987, 1991), (3) deliberative reflection (an active search for alternative viewpoints), (4) personalistic reflection (consideration of emotions, intuition, knowledge, and experience), and (5) critical reflection (consideration of the ethical, moral, social, and political aspects).
Fook	2015	A model with two stages: (1) an analytical process (e.g., exposure to and examination of the hidden assumptions), and (2) transformation of the identified assumptions into new ways of understanding practice.
Sellars	2017	Suggests the use of questions to engage in four types of reflection proposed by Gore and Zeichner (1991).
Körkkö	2019	A model with five stages: (1) the creation of an individual tag set based on personal learning aims; (2) an authentic lesson observation and feedback (optional); (3) a lesson for video recording; (4) a supervisory conversation; and (5) a written reflection.
Korthagen	2017	An "onion" model with five phases: (1) description of a concrete experience, (2) reflection on the ideal situation, (3) building on the ideal expectations whilst utilising individual's strengths, (4) reflection on the barriers; (5) consideration of an alternative approach.
Soedirgo & Glas	2020	A model with four steps for active reflection: (1) the documentation of the process of reflection at all stages, including the design of the research project, (2) systematising reflective thoughts into a summary of individual positionality, (3) inclusion of others in reflection, (4) documenting the thinking process.

third level requires an active search for alternative viewpoints on the identified issues. At the fourth level, personalistic reflection, an individual develops awareness of the impact of emotions, intuition, past knowledge, and experience on cognitive processes. Finally, critical reflection focuses on the ethical, moral, social, and political aspects. It aims to ensure an open-minded and rational judgement and the creativity of an individual when arriving at a particular conclusion. Although showing significant overlap with the reflective frameworks and models discussed earlier, Valli's (1997) model is unique because it recognises the impact of emotions and personal characteristics and background on cognitive and metacognitive processes. Furthermore, although the frameworks of Van Manen (1977) and Valli (1997) have been criticised as hierarchies (Hatton and Smith 1995), they are certainly helpful in that they incorporate multiple aspects of reflective practice.

Gore and Zeichner (1991) offered a model that distinguishes four kinds of reflection, namely academic reflection, social efficacy reflection, developmental reflection, and social reconstructionist reflection. Sellars (2017) elaborated on Gore and Zeichner's (1991) framework by providing a set of questions to engage in more considered reflection within all four dimensions, arguing that for educators, to develop a deep understanding of classroom interactions, questioning and reflecting on all four domains of their practice in crucial.

In the study reported by Fook (2015), participants were encouraged to reflect on their practice in a confidential setting. Each participant is asked to present a piece of work that

was important to them in some way, whilst being encouraged to reflect on this work by an experienced facilitator. Fook's (2015) model has two stages, an analytical stage with the exposure to and examination of the hidden assumptions, and a guided transformation of the identified assumptions into new ways of understanding practice. Another tool for guided reflection was suggested by Körkkö (2019). In her phenomenographic study, participants used a video app as a tool to follow a five-stage reflection procedure: the creation of an individual tag set based on personal learning aims; an authentic lesson observation and feedback (optional); a selection of a lesson for video recording; a supervisory conversation; and a written reflection. Körkkö's (2019) framework embraces ideas of the social constructivism and situatedness of learning, emphasising the interrelationships of personal and social environments which construct and shape learning. Similarly to Sellars, Fook (2015) and Körkkö (2019) placed an emphasis on the role of questions in engaging with reflection.

Building on the earlier work, Korthagen (2017) reported a model with five layers that can be used to facilitate reflection, arguing that to achieve "a deeper meaning in a teaching situation, one has to include the more inner levels" (Korthagen, 2004, p. 395). Finally, Soedirgo and Glas (2020) suggested a framework for active reflection. The first step is the documentation of the process of reflection at all stages, including the design of the research project. Documentation of reflection allows the articulation of a researcher's voice and a consideration of potential power disbalances between actors involved in the research process. Furthermore, early documentation creates a foundation for benchmarking how thinking evolves at later stages. The second step involves systematising reflective thoughts into a summary of individual positionality. At the third step, the researcher addresses the limitations of subjective reflexivity and seeks to include others in that process. For instance, a researcher can discuss self-positionality and individual assumptions with colleagues or seek feedback from a broader audience. The fourth step advocates sharing the thought process in writing. This step ensures transparency about how a researcher arrived at a particular conclusion, making it possible to evaluate the quality of data and its interpretation.

Although it's acknowledged that reflection is a personal practice that can vary among individuals, the models and frameworks discussed above provide valuable insights into reflection and reflexivity as both concepts and a practice. However, there is a notable absence of empirical studies integrating reflection with phenomenographic research design (see exception by Körkkö 2019). Yet, reflection is an important tool for ensuring the rigour and reliability of phenomenographic data analysis, as it provides an opportunity to demystify what is going on in the "black box" of this process.

Theoretical Framework

This study falls within the broader research area of reflective methodology, which emphasises the importance of reflective thinking as advocated by prominent scholars like Dewey, Kolb, Archer, Schon, Alvesson and Sköldberg, and others. In this section, I discuss reflection and reflective practice from the perspective of these scholars aiming to develop a more nuanced understanding of the theoretical foundations of critical reflection.

Dewey: Reflection

Dewey (1910) described reflection as the

> active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further considerations to which it tends (p. 6).

According to Dewey (1910), reflective thought is only possible when the ground of a suggested interpretation is intentionally sought, and the sufficiency of its evidence is critically considered. He argued that the process of reflection is a consequence, rather than just a sequence, of ideas that are ordered in a way that the previous idea supports and justifies the next one. The origin of reflective thinking, according to Dewey, is the confusion that occurs when available data cannot provide a definitive explanation of a phenomenon or a problem. When an individual faces such confusion, the most apparent interpretation known to the individual is the one rooted in one's experience and knowledge. Such a tendency to accept the most apparent explanation is due to the mental uneasiness associated with thinking. However, accepting the initial interpretation without questioning represents uncritical thinking with minimum reflection, whereas reflective thinking represents a judgement that has been suspended until further inquiry. In other words, reflective thinking always requires more effort and is more painful due to the need to overcome thinking inertia and endure a condition of mental unrest and discomfort.

In his later work, Dewey also emphasised the importance to consider the context of a situation, arguing that "we live and act in connection with the existing environment, not in connection with isolated objects" (1939, p. 68). The meaning of isolated facts can be easily misconstrued and corrupted, leading to biased, incomplete, or irrelevant results (Dewey 1939; p. 70). Thus, the "sensitivity to the quality of a situation as a whole" is of highest importance to allow for the controlled "selection and the weighing of observed facts and their conceptual ordering" (Dewey 1939; p. 71).

Schon: Reflective Practice

Despite the importance of his work, Dewey has been criticised for conceptualising reflection as a process of thinking rather than action. To address this issue, Schon (1983, 1987) developed and adapted Dewey's ideas to the practice of reflection. *Reflective practice* proposed by Schon (1983, 1987) aimed to reduce the gap between theory and professional practice. Schon argued that reflection is not necessarily an activity that happens after the event. Instead, it represents a way of approaching an understanding of one's life and actions.

The two dimensions of reflection suggested by Schon (1983, 1987) are reflection-in-action and reflection-on-action. Although based on Dewey's (1910, 1933) work, Schon emphasised the importance of acknowledging that professional knowledge involves knowing both organisational rules and exercising creativity. The rules and actual professional practice differ from each other. By aiming to close the gap between these two areas, reflection-in-action and reflection-on-action provide instruments to translate theory into concrete professional practice.

Although having theoretical and practical value, Schon's theory is not clear about the criteria for determining reflection. This lack of clarity suggests that as far as there is a reflection on something, then reflection is present (Gore and Zeichner 1991).

Kolb: A Personalised Model of Reflection

Kolb's (1984) Experiential Learning Cycle, which consists of four stages, offers a framework that incorporates a reflection on an individual's experience that is then reviewed and evaluated. The first stage, concrete experience, involves acknowledgement and a description of the initial experience, the context of that experience and an individual's response to it. The next stage, reflective observation, involves a deeper reflection of the situation or a phenomenon that has been experienced, to evaluate the initial response and underlying reasons for such a response. Abstract conceptualisation, the third stage, involves reflecting on what could have been done better or differently, seeking alternative approaches and strategies for similar situations in the future. This stage also includes consulting colleagues and literature to enhance understanding and generate new ideas. The last stage, active experimentation, entails putting newly acquired theoretical knowledge into practice, testing out reflections and improvements, and implementing new strategies. Such an approach to reflection ensures that initial interpretation of experience and its response are carefully considered, to form a basis for the next round of reflection. Kolb's model reinforces the idea of reflection as a cyclic process where the initial interpretation of experience and an individual response to it are revised in a conscious way. The adaptation of the elements of the model can support phenomenographic data analysis, as it acknowledges reflective practice as a metacognitive process that involves emotional responses and offers practical guidance that promotes an internal discussion and consideration of an individual's values, beliefs, and context- specific understanding of reality.

Archer: Reflexivity

Like Kolb, Archer extensively focuses on reflection in action. While for Dewey (1910) the importance of reflection was in its power to address a problem of misunderstanding or a mistake, Archer (2007) conceptualises reflexivity as a mediator, an "unknown soldier of social life", that can influence social action and social outcomes (p. 52). For Archer, reflexivity is represented by the "inner speech", an "individual reflection", which is contrasted with external speech (Archer 2007; p. 63). In other words, reflexive thought takes place through internal conversation.

> By questioning and answering questions, we are holding an internal conversation with ourselves and inter alia about ourselves. This is the nature of reflective thought (Archer 2007; p. 73).

Archer advocated a reflexive inner dialogue and supported the statement that without "an effective inner voice, it is very difficult to initiate ideas, develop thought, be creative, and respond intelligently to discourse, plan, control our feelings, solve problems, or develop self-esteem" (Archer 2007; p. 64). Therefore, reflection is a way of researching personal practice or experience to better understand ourselves as knowers and makers of knowledge.

Understanding how social contexts and dominant discourses influence ideas, beliefs, and assumptions helps individuals to make specific connections within and between themselves and broader social and cultural environments.

Alvesson and Sköldberg: Reflective Methodology

Alvesson and Sköldberg (2000), proponents of reflexive methodology, argued that "data and facts […] are the constructions or results of interpretation", and that a researcher's interpretation of them needs to be controlled (p.1). Similarly, Steedman (1991) emphasised that the knower and the produced knowledge cannot be separated. The excessive focus on procedures and techniques to ensure rigour that are common in quantitative research "draws attention away from fundamental problems associated with such things as the role of language, interpretation and selectivity" (Alvesson & Sköldberg, 2000, p. 2). As Alvesson and Sköldberg emphasised, researchers should avoid a trap of assuming that quantitative results are more rigorous and robust than those produced in a qualitative inquiry, as qualitative materials can provide rich information and valuable insights about reality (Alvesson & Sköldberg, 2000).

Alvesson and Sköldberg (2000) explain that the reflexive approach to research starts with scepticism towards "unproblematic replicas of the way reality functions", which consequently "opens up […] opportunities for understanding rather than establishing "truths" (Alvesson &Sköldberg, 2000, p. 5). The authors distinguish two elements of reflective inquiry, namely "careful interpretation and reflection" (Alvesson & Sköldberg, 2000, p. 5). The first element puts interpretation to the fore of the research process, emphasising that empirical data (e.g., observations, interviews, measurements), as well as secondary data (e.g., statistics, archival data), are subjects of interpretation. Reflection, in turn, provides an opportunity to systematically consider the influence of "the researcher, the relevant research community, society as a whole, intellectual and cultural traditions, […].language and narrative" on the interpretation and the research processes (Alvesson & Sköldberg, 2000, p. 6). Alvesson and Sköldberg (2000) draw attention that during such reflective inquiry "the centre of gravity is shifted from the handling of empirical material towards […] a consideration of the perceptual, cognitive, theoretical, linguistic, (inter)textual, political and cultural circumstances that form the backdrop to the interpretations" (Alvesson & Sköldberg, 2000, p. 6).

Methodology

Approach to Analysis

The overarching question in this study is *"What framework might be developed from the literature on reflection to guide the reflection process during the phenomenographic data analysis?"* To address this question, a comprehensive methodology was required. A search for relevant examples in the Scopus database using terms such as "phenomenography", "phenomenographic", "reflection", "reflective practice", and "reflexivity" over the last 20 years revealed few studies discussing tools or frameworks for reflection, with some reporting the use of reflection *ex post facto* (Gustafsson et al. 2009; Korhonen et al. 2017; Körkkö

et al. 2019). To explore the variety of methods and ideas on reflection, I turned to theoretical research and empirical studies that documented its application in practice. A consideration of the literature was also helpful in understanding different schools of thought and approaches to reflection within various methodologies. Practical examples of reflection served as a starting point for the development of the RPF, with the methodology for its development presented in Table 2.

1. Reflective thinking originates from confusion (Dewey 1910).
2. A proposed solution or interpretation of the data needs to be continuously examined against the empirical data.
3. Reasoning should involve searching for the evidence within the broader context of data to support the initially proposed interpretation. Locating the interpreted pieces of data within the broader data pool is crucial to avoid misconstrued interpretations (Dewey 1939).
4. Documenting the reasoning process is crucial for ensuring that the proposed interpretation is carefully considered, with a close attention to the available evidence found in data.
5. A decision to accept or reject a proposed interpretation is evaluated against the evidence of how 1) it is grounded in the data and 2) its fit to the broader context.

In addition, prior research advocates the formulation of a written positionality statement, to disclose personal standpoint, beliefs, values, assumptions, and accepted paradigms, as well as document how they are evolving throughout the research process (D'Arcangelis 2018; Soedirgo and Glas 2020). By engaging in this cyclic reflection, a phenomenographer overcomes thinking inertia by proposing a number of alternative interpretations of the data, and evaluating each interpretation against the evidence found in data. In doing so, a researcher suspends initial unreflective interpretation of the data, maintaining the analysis in a controlled, considered and transparent way.

The following principles reflect the cyclic nature of reflective practice of the proposed framework, as visualised in Fig. 1.

Table 2 Steps of the RPF development

Literature review	Examination of the frameworks for reflection documented in the literature by (1) searching for articles using a combination of keywords "reflection", "reflective practice", "reflexivity" and "model", "framework", "guidance", and (2) reference checking method (Horsley et al. 2011). Summary of the review results are presented in the Literature review section.
Theoretical basis for the framework	Review of the work of Dewey (1910, 1939), Shon (1983, 1987), Kolb (1984), Archer (2007) and Alvesson & Sköldberg (2000). Analysis of the results is presented in the Theoretical framework section.
Synthesis of the review results	Synthesis of the results from the previous steps to select elements of reflection that can be adopted to phenomenographic methodology.
Formulation of the principles and steps of the Reflective Practice Framework (RPF)	Merging the results of the empirical studies with insights from theoretical works into the principles of RPF. Visual presentation of the RPF principles in the cyclic form, with a detailed description of each step.

The process outlined above resulted in the formulation of the following principles, which formed the foundation for the RPF (Fig. 1):

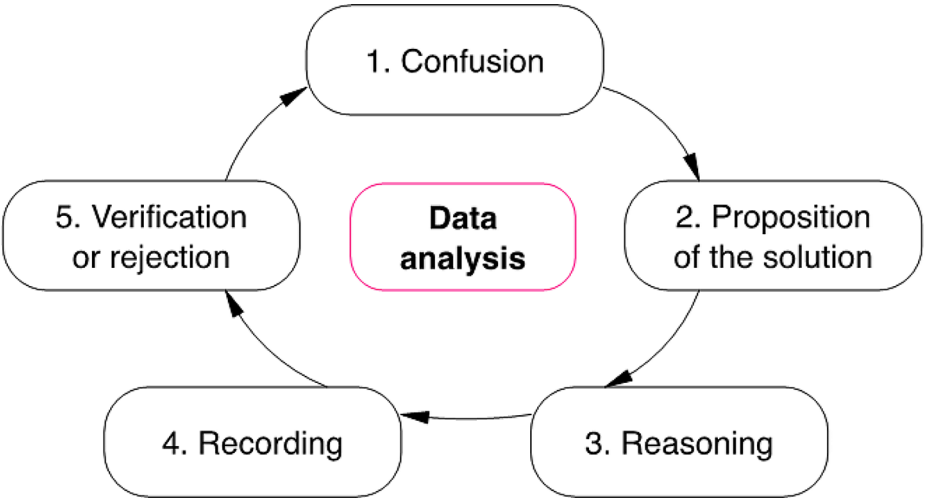


Fig. 1 Elements of the reflective practice framework. (Source: Rotar 2023)

The application of RPF was tested in the author's publications (see Rotar 2021; Rotar 2022; Rotar 2023).

A Systemic Approach to Reflection

There is no single algorithm to analyse phenomenographic data as this process is "iterative and genuinely interpretive in nature" (Marton, 1986, p. 282). Bowden and Walsh (2000) suggested that the categories of description that derive from the data are not discovered but rather constructed by a researcher. Marton (1986) proposed four steps of the analysis of phenomenographic data, although those are very general. The model suggested by Dahlgren and Fallsberg (1991) contains seven steps and provides more explicit guidance than that offered by Marton. However, it does not offer a scaffolding to maintain the transparency of the analytical process. Considering these limitations, I advanced Dahlgren and Fallsberg's (1991) analytical model by adding an additional step (see Appendix 1) and propose supporting the analysis with reflective practice using the RPF to increase transparency and maintain the rigour of phenomenographic data analysis.

Ison (2018) stated that "systems practice comprises systemic and systematic practice understood as a duality" (p. 5). The RPF offers dual guidelines that include step-by-step reflection on the data analysis and a reflection on personal and situational factors, making this process holistic. It initiates and guides critical thinking to understand the complexities of a researcher's engagement with the data. It also allows us to scrutinise the contributors to the knowledge production, as well as to understand their contexts, as "all practice is situated" and is "the product of an evolutionary, biological, cultural, family and intellectual/social history" (Ison 2018; p. 5). Consideration of systemic factors mentioned above through reflective, relational thinking is critical for uncovering hidden interests and to be open to alternative perspectives (Ison 2018). This is what an application of RPF can assist with.

Results

This section describes the constituent parts of the PRF: the positionality statement (level one) and five steps of reflection (level two), namely confusion, the proposition of a solution, reasoning, recording and either verification or rejection of the proposed solution (see Fig. 1). The framework helps to make the personal perspectives of the researcher which are embedded in the thinking and decision-making processes transparent, reasoned, and based on facts. In addition, it allows ethical considerations and inclusion of professional values and is open to the discussion of alternative perspectives. In other words, the five elements of the framework serve as tools for considered and ongoing reflection during the eight steps of phenomenographic data analysis (see Appendix 1). The application of the RPF to the data analysis is shown in Table 3, and explained in detail in the following part of the paper.

Level One: Developing a Positionality Statement

Harding (1989) argued that understanding a researcher's position is critical in qualitative inquiry as it makes the voice of the research visible and confident. Commitment to reflexivity provides an opportunity to assess qualitative research with a consideration of a researcher's position (MacLean et al. 2019; Soedirgo and Glas 2020). To make use of this opportunity, D'Arcangelis (2018) and Soedirgo and Glas (2020) advocate the disclosure of self-positionality. The development of positionality statements allows for what Archer (2007) calls internal conversation, where self-questioning is conducted in a conscious manner. In a phenomenographic study, articulating individual positionality is particularly important. When analysing data, a phenomenographer interprets a participant's interpretation of the phenomenon, and thus, it is critical to distinguish the two voices explicitly. In the positionality statement, a researcher acknowledges that the interpretation of the phenomenographic data is mediated by a researcher's beliefs, values, assumptions, and accepted paradigms. Another aim of the positionality statement is the gradual construction of a researcher's position in relation to a research study. Habermas (1974) regarded this act as a self-determined action. Calderhead (1989) agrees with this perspective, noting that:

> Reflection is viewed as a process of becoming aware of one's context, of the influence of societal and ideological constraints on previously taken-for-granted practices and gaining control over the direction of these influences. (p. 44)

Developing a positionality statement continuously throughout the research process authentically engages a researcher in each aspect of reflection and allows the recognition and acknowledgement of the origins and impact of the researcher's own belief systems, values, and prior knowledge and experience on the research process.

The identification of positionality is not a straightforward process. Even with reflection, there is a risk of "reflexive inclusion" of the self into the piece of research (Day 2012; p. 69), which comes from the idea that a researcher actively contributes to knowledge production. Thus, an analysis of the self rather than mere disclosure is an essential element of the reflexive technique. Self-analysis involves reflection on one's theoretical perspectives and past methodological practices, and how those may influence the study. In addition, the

Table 3 Application of the reflective practice framework to phenomenographic data analysis

Step of the data analysis	Description of the procedure	Application of the Reflective Practice Framework
Level 1. Positionality statement		
	Clarification of a researcher's authority, credibility, knowledge.	Writing an initial positionality statement. The positionality statement should cover, but not limited to, such elements as (i) confession about a researcher's motivation, experience, and the dependence on participants' accounts, (ii) discussion of a researcher's identity or multiple identities with the aim to inform the reader whether the researcher is an insider or outsider, and (iii) discussion of a researcher's theoretical perspective, past methodological practices and how these may affect the research.
Level 2. Reflection on the data analysis process		
Familiarisation	Reading through the transcripts, listening to audio-recorded interviews.	Steps of reflection: Confusion.
Reduction	Identification of the most distinctive utterances in relation to the research questions in order to create a data pool.	Steps of reflection: Confusion, Proposition of the solution, Reasoning and Documentation. At this step of the data analysis, Reasoning and Documentation involve reflection on why a researcher sees particular utterances as meaningful or striking, with the aim to initiate an additional search for alternative, potentially relevant utterances.
Comparison	Examination and comparison of the data piles (utterances) within the data pool to distinguish differences and similarities.	Steps of reflection: Confusion, Proposition of the solution, Reasoning, and Documentation. At this step of the data analysis, Proposition of the solution, Reasoning and Documentation involve asking specific questions about how a particular utterance relates to the research question(s). For instance, the following questions may be asked: Does this utterance refer to how my study participants appear to relate to the phenomenon? Does this utterance refer to an example of how my study participants perceive or engage with the phenomenon under question?, Does this utterance indicate, in either direct or indirect way, the significance of the phenomenon for my study participants? Once the number of utterances are proposed, a researcher should pose the same questions again, in order to identify more utterances that are potentially relevant to the posed question. Asking questions as provided in the example above allows a researcher not only to maintain focus on the research aims and the phenomena under question, but also to uncover meanings in the data that may not be immediately apparent. At this step of analysis, a researcher also better familiarises him/herself with the utterances and is getting a better sense on the differences and similarities among the study participants' meaning assigned to the same phenomenon.

Table 3 (continued)

Step of the data analysis	Description of the procedure	Application of the Reflective Practice Framework
Preliminary grouping	Preliminary systematisation and grouping of utterances that seem to represent similar ways of conceptualising a phenomenon	Steps of reflection: Confusion, Proposition of the solution, Reasoning, Documentation, Verification or Rejection. At this stage of the analysis, a researcher engages in an active process of grouping utterances that appear to represent similar ways of conceptualising a phenomenon, yet distinguish important differences in individuals' conceptualisations, e.g. differences in the level of understanding, contextual differences in understanding the phenomenon, the scope of grasping the phenomenon, etc. A researcher is strongly encouraged to go through all five steps of reflection, cultivating confusion and generating alternative decisions on whether the identified ways of conceptualising a phenomenon are seen as similar, different or related in any way.
Articulation	Capture through the statement of the essential meaning of a proposed category.	Steps of reflection: Documentation The piles of data/utterances associated with the proposed category are scrutinised in order to develop a central meaning of the category. A focus on the documentation of the thinking process is important at this stage, as it shows the evolution of the proposed categories and ensures that the voice of the researcher is «visible» to the reader.
Labelling	Finding the criterion that attributes for each potential category, highlighting the essence of each category by giving it a name.	The name of categories can be made using students' quotations, or by assigning a metaphor to each category.
Contrasting	Distinguishing critical features of the conceptualisation of the phenomenon that can be seen across and within identified categories	Steps of reflection: Confusion, Proposition of the solution, Reasoning, Documentation, Verification or Rejection. Building on insights and interpretation of the data documented at the Comparison step of the data analysis, a researcher's focus is (i) on identifying features in the conceptualisations of the phenomenon (the meaning assigned to the phenomenon) that can be noted across all categories, and (ii) on consideration of the mutual relationships across categories. A researcher is strongly encouraged to go through all steps of reflection, starting with the confusion about the final number of categories, their order and structural relationships, and documenting each proposed set of categories, together with an explanation of why a particular area of variations have been prioritised and selected for inclusion into that final set. As a result, a researcher should have a number of alternative sets of categories, with variations within and across each category, and notes on their justification and representation of the data. A researcher is also encouraged to revise a positionality statement, to reflect on the experience of interpreting a study participants' accounts, with the aim to capture whether a particular identity, assumption, perspective etc. is influencing his/her work with the data.

Table 3 (continued)

Step of the data analysis	Description of the procedure	Application of the Reflective Practice Framework
Development of the Outcome Space	Development of the model which presents distinctive characteristics of each category, resemblances, and relations between them.	Steps of reflection: Confusion, Proposition of the solution, Reasoning, Documentation, Verification or Rejection. At this step, a researcher is required to: (i) identify logical relationships between and within the categories, and (ii) present these relationships in the form of a model (an outcome space) that represents variations across the study participants' accounts and their structural relationships (Ashwin, 2006). Categories are logically related to each other in terms of a referential (meaning) aspect and a structural aspect. The referential aspects, captured by distinctive categories, are the differences or shifts in the meaning assigned to the phenomenon under investigation by the study participants. The structural aspects define the categories by what is (i) emphasised or (ii) left in the background in the participants' accounts, showing variations that span all categories. Together, the referential and structural aspects create an inclusive hierarchy, with each new category incorporating and expanding upon the previous ones (Ashwin, 2006; Ashwin et al. 2014). Due to the likely complexity in understanding the phenomenon, the process of developing an outcome space is challenging and may involve confusion. Using a RPF, a researcher is encouraged to produce a number of alternative outcome spaces. A researcher is encouraged to seek evidence in data to identify hierarchy and think about alternative hierarchical structures. The evolution of the outcome space and its hierarchy is made visible by documenting each the process of reasoning and verification/rejection in relation to each proposed outcome space.

researcher may clarify which of their identities is most significant for research outcomes, e.g., a woman, a parent, a student, an adult, or a multidimensional identity.

By continuously working on the positionality statement, a researcher is committed to acknowledging the evolution of his or her position, identity, authority, the dependence of research on participants' accounts, and to thinking about the potential implication of all of these on the data analysis process.

Level Two: Five Steps of Reflection

Step 1. Confusion

As depicted in Fig. 1, I propose that reflection on phenomenographic data analysis necessarily starts with a state of confusion. Confusion arises when a researcher encounters rich, unstructured phenomenographic data. When working with unstructured data, a researcher can only *suggest* how to organise the participants' utterances and how to approach the interpretation of their accounts. At this stage, the risk of uncritical thinking is high. Since insights and suggestions that arise in a researcher's mind are inevitably influenced by their prior experience and knowledge (Dewey 1910), he or she must not terminate the thinking process by accepting initially emerged interpretations of the data and explanation of their own patterns of thinking. Without suspending judgement, the immediate conclusion removes the possibility of reflective thinking and the exploration of the subjective influence of a researcher.

When dealing with unstructured phenomenographic data, experiencing difficulty or confusion is common. An essential part of the reflective thinking technique in phenomenographic inquiry is the cultivation of such uneasiness or confusion. This postpones the first suggestion of a solution until the nature of confusion has been thoroughly explored. Such practice, according to Dewey (1910), is an indicator of critical and reflective thinking.

Step 2. Proposition of the Solution

The next step of reflection—proposition of the solution—presumes a more intimate and extensive consideration of the interpretation proposed by a researcher and involves a careful examination of the empirical data. Working with unstructured phenomenographic data entails transitioning from what is present (raw data) to what is absent and can only be proposed (interpretation of the data) (Dewey 1910). Hence, the process of interpretation is somewhat speculative and exploratory.

The initially suggested interpretation constitutes an idea, proposition, guess, hypothesis, or theory (Dewey 1910). Once suspended, the postponement of an initial interpretation awaits further evidence. At this stage of reflection, a researcher is required to cultivate a variety of alternative interpretations. The final conclusion depends on the existence of evidence and the presence of rival conjectures of probable explanation in its favour. Cultivating a variety of alternative suggestions is a crucial factor in good reflective thinking, which is in line with the third level of reflection in Valli's (1997) model that advocates an active seeking of alternative viewpoints in interpreting the situation.

Step 3. Reasoning

At the reasoning stage, accepting the interpretation in its initial form is prevented until alternative options are exhausted and evaluated with scrutiny (Alvesson & Sköldberg, 2000; Dewey 1910). Conjectures that seemed plausible at first glance could be found lacking grounding in data. Even when the reasoning does not lead to the rejection of the proposed interpretation, it refines the interpretation into a form that is more reflective of the study participants' accounts of the phenomenon. Simultaneously, interpretations that initially seemed weak may gain more elaboration and transform during this stage of reflection. Dewey (1910) emphasised that the development of interpretation through reasoning helps to "supply the intervening or intermediate terms that link together into a consistent whole apparently discrepant extremes" (Dewey 1910; p. 76).

While interpretation is inferred from given data, reasoning begins with an interpretation. Reasoning has the same effect on a suggested interpretation as more extensive observation has on the original problem. By searching for evidence in data to support the proposed interpretation and by examining the context within which that evidence is found to better understand the interpretation, a researcher engages in the reasoning process and facilitates deeper reflection.

Step 4. Documenting or Recording

One of the most challenging tasks of qualitative research is to represent the truth in the findings and allow the voices of those involved in the study to be heard. This is especially true

for phenomenographic research, which takes a second-order perspective. The documenting step within the RPF allows researchers to consolidate outcomes of reflective thought and ensure transparency and validity of analysis and interpretation. Just like emphasised by Van Manen (1990) who advocated written reflection as a tool for more in-depth interpretation, documentation of reflective process enables recording an evolution of a researcher's positionality, articulating the researcher's voice, reflecting on potential power relations between the researchers and participants, and, finally, recording and revising identified assumptions.

There is also another important reason for documenting reflection. According to Dewey, during internal conversations, individuals understand their own meanings and often use abbreviations and shortcuts in their inner dialogue. Through the documentation of reflection, implicit ideas and insights are made explicit and visible, and what was unconsciously assumed is exposed to examination, resulting in more critical and fruitful thinking.

Step 5. Verification or Rejection

The fifth step of the RPF is the verification (or rejection) of the proposed interpretation. At this step, conditions are deliberately arranged according to the requirements of the interpretation to see if the empirical evidence supports the results. When the proposed interpretation is firmly grounded in data, the confirmation is strong enough to support a conclusion, at least until contrary facts suggest the need for revision or rejection (Dewey 1910). Otherwise, the suggested interpretation is rejected, and a new cycle of reflection begins again with confusion. The process of grounding the interpretation and conclusion in empirical evidence addresses potential fallacious intrinsic and extrinsic beliefs.

Discussion

This paper introduces the RPF, which has been developed based on ideas adapted from theoretical and empirical studies, including works by Dewey (1910, 1937), Schon (1983, 1987), Kolb (1984), Archer (2007), Van Manen (1977), Valli (1992), Korthagen (2017), Soedirgo and Glas (2020), and others. The RPF incorporates the idea of translating the theory of reflection into practice (Schon, 1983, 1987), while addressing a limitation of past research regarding the lack of guidance for reflection.

The first level of reflection involves the development of a positionality statement. This process authentically engages a researcher in each aspect of reflection and allows the recognition and acknowledgment of the origins and impact of the researcher's own belief systems, values, and prior knowledge and experience on the research process. Another aim of the positionality statement is the gradual construction of a researcher's position, making his or her voice explicit. Developing a positionality statement allows phenomenographers to conduct a more authentic reflection, as opposed to the "bracketed" reflection criticised by such phenomenological scholars as Husserl (1965) and Van Manen (1990).

The second level of reflection involves five steps: confusion, proposition of a solution or interpretation, reasoning, documentation of the reasoning process, and acceptance or rejection of the proposed solution or interpretation. The RPF guides a phenomenographic researcher to generate multiple alternative interpretations of the data (Korthagen 2017; Valli 1992), forcing the researcher into a state of mental uneasiness, a necessary condition for

critical and reflective thinking (Dewey 1910, 1939). An active search for alternative interpretations is particularly relevant for phenomenographic data analysis due to the highly interpretive nature of phenomenographic methodology.

Similar to Schon (1983, 1987), the RPF promotes reflection during the analysis process rather than after it. The RPF incorporates elements from Kolb's (1984) Experiential Learning Cycle model and the work of Archer (2007). Both scholars endorse acknowledging, examining, and negotiating personal experiences and their contexts, as well as actively questioning initial interpretations often influenced by an individual's values, beliefs, and context-specific understandings of reality. One of the difficulties of reflective practices is the perceived importance of being objective in research. However, the philosophical debate regarding an individual's capacity to present an objective perspective becomes muted in the face of the position that all objectivity is first understood as subjective experience (Nisbett, 2005). Critical scrutiny of the origins, validity, and limitations of personal subjective interpretation allows a researcher to become more open to other research perspectives.

The proposed RPF provides practical guidance to enhance the quality of thinking and judgement and offers a more realistic approach to reflection that values individuals' holistic nature and embraces the limitations of a researcher's subjectivity (Sellas, 2017). By acknowledging that any interpretation is likely based on experience and prior knowledge, the RPF facilitates the suspension of immediate, uncritical interpretation of data (Dewey 1910). By engaging in ongoing inner dialogue during the documentation process (journal writing, note-taking, and articulating the data analysis procedures to a wider audience), a researcher can better understand how they arrived at a particular conclusion. Furthermore, documenting makes the reflection process available to readers, allowing for independent evaluation of the research results and increasing the trustworthiness and credibility of the research (Anfara et al. 2002). Glesne and Peshkin (1992) emphasised that reflection, monitoring, and justification of a researcher's influence are essential elements of becoming a better qualitative researcher. The RPF aims to assist novice phenomenographers in developing self-reflective awareness (Finlay 2008) and help avoid the typical social science trap of tending to notice evidence that "corroborates a favourite belief more readily than that which contradicts it" (Dewey 1910; p. 7).

Implications for Theory and Practice

This paper contributes to the body of research on reflective methodology (Alvesson and Skolberg 2009), complementing research on descriptive phenomenology (Husserl 1965; Sanders 1982) and hermeneutic or interpretive phenomenological methodology (Heidegger, 1988; Van Manen 1990). Åkerlind (2005) argued that phenomenographic methodology is often applied without a clear understanding of its unique methodological requirements. This paper addresses this methodological limitation. By supplementing analytical procedures with the holistic framework for in-depth reflection, this paper contributes to the methodology development. The RPF advances phenomenographic methodology with a tool that provides an opportunity to demystify the data analysis process. In doing so, this paper emphasises the importance and the role of reflection in a highly interpretive phenomenographic approach, which can ensure the rigour of the research.

On a practical level, the RPF offers a systemic approach which combines consideration of personal and situational factors with step-by-step guidance on how to reflect on the

phenomenographic data analysis. The application of the RPF initiates and guides critical thinking in the process of data analysis and allows to account for the complexities of the researcher's engagement with the data.

Conclusion

This article describes the RPF developed to assist phenomenographic data analysis. It begins with outlining the theory and origins of reflection and reflective thinking, reviews empirical studies on the practical application of reflection, elaborates on the development of the framework, and describes its elements.

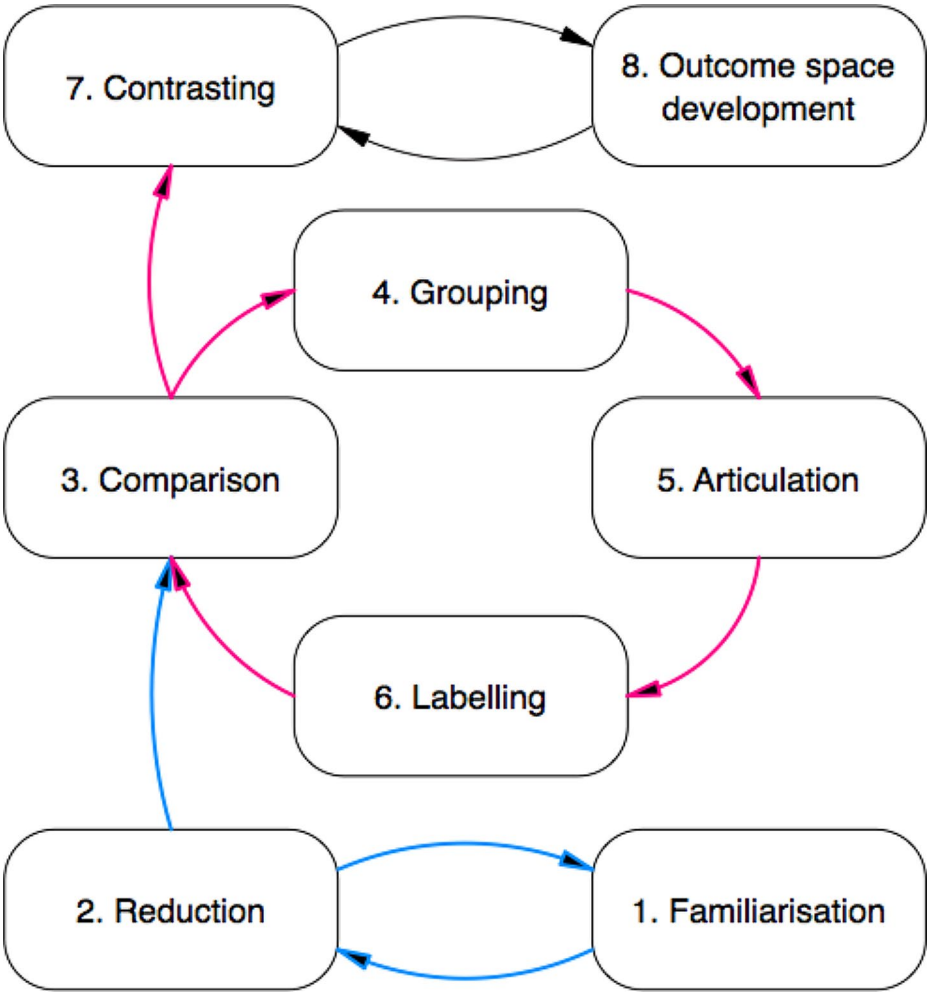
The RPF is unique in several ways. First, it offers a tool for reflection specifically designed to enhance phenomenographic data analysis. Second, it takes a systemic approach to reflection, accounting for multiple influential factors. Finally, it contributes to methodology development, showing the value of reflection in addressing the issue of the "black box" of phenomenographic data analysis by acknowledging the subjective influence of the researcher during this process. Specifically, the application of the RPF demystifies the process of working with unstructured phenomenographic data. Guided reflection on two levels helps to make the phenomenographic data analysis more transparent, elucidating conflicting interpretations and insights, and helps the evolution of a researcher's understanding of data. The RPF invites phenomenographers into ongoing ethical engagement and considerations of choices made throughout the research, offering what Guillemin and Gillam refer to as practical application of ethics.

Several limitations of the framework should be mentioned. First, phenomenography employs the second order perspective to examine reality, e.g. through the meaning that is assigned to reality by study participants. Although the RPF can assist in revealing assumptions and biases held by a researcher, there is still a risk of "reflexive inclusion" or "writing the self" into the piece of research (Day 2012; p. 69). To identify and control such practice, self-analysis, rather than the mere disclosure of a researcher's positionality, is an essential element of the reflexive technique (Day 2012). This is an important concern that should be kept in mind during the development of a positionality statement. Secondly, during reflection, the process of interpretation of unstructured phenomenographic data is somewhat speculative. Thus, the quality of interpretation depends on the researcher's willingness to sustain the uneasiness of the confusion (Step 1 of the RPF) and on a desire to generate alternative interpretations of the data (Step 2 of the RPF). There is also a risk of being stuck in a critical thinking loop, where the search for alternative solutions can develop into an obsession with finding a better interpretation. Another limitation of the framework is related to the scarcity of time required for the documentation of reflective thinking (Step 4 of the RPF), compared to the fast going process of internal dialogue associated with thinking. Although detailed documentation minimises the risks of misinterpretation and elaborates on implicit assumptions and insights, often such practice is sacrificed to meet the timeframes of the research project.

The application of the RPF raises the question of how a researcher participates in knowledge production throughout the research process and allows them to approach this process in a more considered way. By offering a tool to mitigate the risks of an individual's subjectivity

in phenomenographic research, this article provides an instrument for reflection specifically designed for novice phenomenographers, contributing to methodology development.

Appendix 1. Model of Phenomenographic Data Analysis



Source: adopted from Dahlgren and Fallsberg (1991)

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